

Europäisches Patentamt
European Patent Office
Office européen des brevets



(11) EP 0 955 584 A3

(12)

EUROPEAN PATENT APPLICATION

(88) Date of publication A3:
21.03.2001 Bulletin 2001/12

(51) Int Cl.7: G06F 9/46

(43) Date of publication A2:
10.11.1999 Bulletin 1999/45

(21) Application number: 99650040.1

(22) Date of filing: 05.05.1999

(84) Designated Contracting States:
AT BE CH CY DE DK ES FI FR GB GR IE IT LI LU
MC NL PT SE
Designated Extension States:
AL LT LV MK RO SI

(72) Inventor: Shaylor, Nicholas
Newark, CA 94560 (US)

(74) Representative:
Parkes, Andrew John Aykroyd et al
c/o Tomkins & Co.
5 Dartmouth Road
Dublin 6 (IE)

(30) Priority: 06.05.1998 US 73637

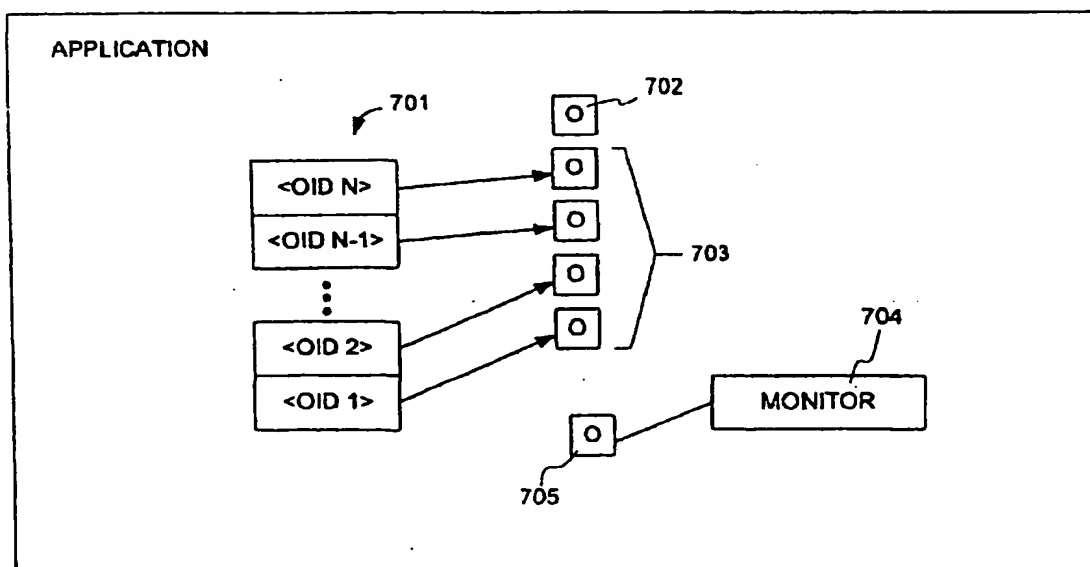
(71) Applicant: SUN MICROSYSTEMS, INC.
Palo Alto, California 94043 (US)

(54) Fast synchronization for programs written in the java programming language

(57) A method, system, and computer program product for synchronized thread execution in a multi-threaded processor are described. Each synchronized thread refers to at least one object (702, 703, 705) identified by an object identification (OID) that is shared among a plurality of synchronized threads. One of the

synchronized threads is selected for execution. Upon entering the selected thread, an entry sequence indicates that the shared object (703) should be locked by pushing its OID onto a lock stack (701). The operations defined by the selected thread are executed and the indication is removed by pushing the OID from the lock stack.

FIG. 7



EP 0 955 584 A3



European Patent
Office

EUROPEAN SEARCH REPORT

Application Number
EP 99 65 0040

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.6)
A	<p>BERSHAD B N ET AL.: "Fast mutual exclusion for uniprocessors"</p> <p>FIFTH INTERNATIONAL CONFERENCE ON ARCHITECTURAL SUPPORT FOR PROGRAMMING LANGUAGES AND OPERATING SYSTEMS (ASPLOS-V), BOSTON, MA, USA, 'Online! vol. 27, no. 9, 12 - 15 October 1992, pages 223-233, XP000330603</p> <p>SIGPLAN Notices, ACM, USA</p> <p>ISSN: 0362-1340</p> <p>ACM Digital Library</p> <p>Retrieved from the Internet:</p> <p><URL:http://www.acm.org/pubs/articles/proceedings/asplos/143365/p223-bershad/p223-bershad.pdf> 'retrieved on 2001-01-29!</p> <p>* abstract *</p> <p>* page 224, right-hand column, line 3 - page 226, left-hand column, last line *</p> <p>---</p>	1,12,18,24	G06F9/46
P,A	<p>EP 0 840 215 A (SUN MICROSYSTEMS INC)</p> <p>6 May 1998 (1998-05-06)</p> <p>* abstract *</p> <p>* column 5, line 6 - line 47 *</p> <p>* column 7, line 25 - column 30, line 50 *</p> <p>---</p> <p>-/-</p>	1,12,18,24	<p>TECHNICAL FIELDS SEARCHED (Int.Cl.6)</p> <p>G06F</p>
The present search report has been drawn up for all claims			
Place of search		Date of completion of the search	Examiner
THE HAGUE		29 January 2001	Wiltink, J
<p>CATEGORY OF CITED DOCUMENTS</p> <p>X : particularly relevant if taken alone</p> <p>Y : particularly relevant if combined with another document of the same category</p> <p>A : technological background</p> <p>O : non-written disclosure</p> <p>P : intermediate document</p> <p>T : theory or principle underlying the invention</p> <p>E : earlier patent document, but published on, or after the filing date</p> <p>D : document cited in the application</p> <p>L : document cited for other reasons</p> <p>-----</p> <p>& : member of the same patent family, corresponding document</p>			

EPO FORM 1503 03.92 (P4/C01)



European Patent
Office

EUROPEAN SEARCH REPORT

Application Number
EP 99 65 0040

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (InCL1.6)
P, A	<p>BACON D F ET AL.: "Thin locks: featherweight synchronization for Java" ACM SIGPLAN '98 CONFERENCE ON PROGRAMMING LANGUAGE DESIGN AND IMPLEMENTATION (PLDI), MONTREAL, QUE., CANADA, 'Online! vol. 33, no. 5, 17 - 19 June 1998, pages 258-268, XP000766275 SIGPLAN Notices, ACM, USA ISSN: 0362-1340 ACM Digital Library Retrieved from the Internet: <URL: http://www.acm.org/pubs/articles/proceedings/pldi/277650/p258-bacon/p258-bacon.pdf> 'retrieved on 2001-01-29! * abstract * * page 259, right-hand column, line 6 - page 261, left-hand column, line 41 *</p>	1, 12, 18, 24	
			TECHNICAL FIELDS SEARCHED (InCL1.6)
The present search report has been drawn up for all claims			
Place of search	Date of completion of the search	Examiner	
THE HAGUE	29 January 2001	Wiltink, J	
CATEGORY OF CITED DOCUMENTS		<p>T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document</p>	
<p>X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document</p>			

EPO FORM 1503 03/85 (P04C01)

ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.

EP 99 65 0040

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

29-01-2001

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP 0840215 A	06-05-1998	US 6134627 A	17-10-2000
		AU 4273397 A	07-05-1998
		JP 11031081 A	02-02-1999
		SG 54586 A	16-11-1998
		US 6167424 A	26-12-2000
<hr/>			

EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82